CLAIMS

1. Process for the formation of a silicon layer (22a, 22b, 32, 34) for optical purposes with a given (optical) thickness, on a support (10), characterized in that it comprises the following steps:

a) Molecular bonding of a silicon block (20a, 20b) on the support on which there may or may not already be other layers, the silicon block having a surface layer (22a, 22b, 32, 34) delimited by a cleavage area (21) approximately parallel to its surface, and with a thickness greater than (or less than) the said determined thickness, and the silicon block being covered by a silicon oxide layer (12a, 12b) brought into contact with the support during bonding,

b) cleavage of the silicon block along the cleavage area to detach the surface layer fixed to the support from it,

c) thinning (or thickening) the said surface layer until a thickness approximately equal to the said determined thickness, is obtained.

2. Process according to claim 1, in which the thickness of the surface layer (22a, 22b) of the silicon block used in step a) is greater than the determined thickness, and in which thinning of the surface layer in step c) comprises at least one oxidation operation followed by at least one etching operation and/or one polishing operation.

3. Process according to claim 1, in which the thickness of the surface layer (22a, 22b) of the silicon block (20a, 20b) used in step a) is less than the determined thickness, and the thickness of the surface layer is increased by crystalline growth during step c).

4. Process according to claim 1, in which a hydrogen implantation is performed before step a) through one of the faces (23) of the silicon block to form an embrittled area (21) in the block (20a, 20b) extending approximately along a plane parallel to the said face and forming the cleavage area, the implantation energy being adjusted to form the cleavage area at a depth which is either greater than or less than the determined thickness.

5. Process for manufacturing a Bragg mirror with wavelength λ on a support, in which a stack of layers is formed comprising alternately at least one layer of silicon oxide (12a, 12b) with optical thickness $\frac{\lambda}{4n_o}$, where n_o denotes the refraction index of the silicon oxide, and at least one silicon layer (22a, 22b) with an optical thickness equal to $\frac{\lambda}{4n_s}$, where n_s is the refraction index of silicon, and in which the said silicon layer is formed according to the process mentioned in claim 1.

6. Process according to claim 5, in which the silicon oxide layer may be formed by chemical vapor deposition using a Plasma Enhanced Chemical Vapor Deposition (PECVD) process.

7. Process for manufacturing an optical component with a working wavelength λ comprising:

- the formation of a Bragg mirror (30) according to the process described in claim 5,
- formation of a layer of active material (34) on the Bragg mirror by crystalline growth, to form a cavity,
- formation of a second mirror (36) on the cavity.

8. Process according to claim 7, in which the active material is chosen from among pure silicon, silicon containing one impurity, silicon carbide SiC and Si_xGe_{1-x} alloys where $0 < x < 1$.

9. Process according to claim 7, comprising the formation of a second mirror by deposition of a metallic layer on the cavity.

10. Process according to claim 7, including the construction of the second mirror in the form of a Bragg mirror according to claim 5.

11. Process for manufacturing an optical component including the formation of a Bragg mirror on a support

according to the process in claim 5, followed by the formation of an optical cavity by crystalline growth of at least one active material.

12. Process for the manufacture of an optical structure comprising:

- formation of a first Bragg mirror (30) on a support,
- formation of a silicon layer (32) on the Bragg mirror, according to the process according to claim 1, and
- formation of a second mirror (36) above the silicon layer.

13. Process according to claim 12, in which the first and second mirrors are Bragg mirrors made according to the process in claim 5.

14. Process according to claim 12, in which the optical thickness of the silicon layer (34) is equal to $\frac{\lambda}{4n_s}$, where λ is the working wavelength of the optical structure and n_s is the refraction index of the silicon.

15. Process according to claim 12, in which one or several layers (34) of active material chosen among SiGe, SiGeC and SiC are grown on the silicon layer before the formation of the second mirror, to form an optical cavity.